

REMARKS

In the Office Action, claims 1-3, 8, 11, 12, 15, 16, 19-21 and 23 were rejected under 35 U.S.C. § 102(e) as being unpatentable over Shiraishi et al. (U.S. Patent Number 6,144,530, hereinafter Shiraishi).

Under claim 1 of the present application, a data storage device is provided with a slider support formed of a track accessing arm and a suspension that comprises at least one surface having at least two grooves. These grooves are separated from each other in a direction substantially parallel to the mean airflow direction so as to cause vortices in a turbulent airflow to be kept distant from the surface.

Shiraishi does not show or suggest grooves on a surface that are separated from each other such that vortices in a turbulent airflow are kept distant from the surface. Shiraishi makes no mention of how its air-cooled radiators interact with a turbulent airflow.

In the Office Action, it was asserted that the grooves of the V-shaped embodiment of Shiraishi produced vortices above and away from the surface because of negative pressure pockets that interact with the turbulent airflow which impinges upon the multi-groove structure. However, Shiraishi makes no mention of negative air pockets in the air-cooled radiators or that these negative pressure pockets interact with a turbulent airflow in such a way so as to keep vortices some distance from a surface. In fact, such an interaction would appear to be undesirable in Shiraishi since the cooling fins are designed to transport heat away from the slider. As such, these fins would be designed so that air interacts with the fins as much as possible to transport more heat away from the slider.

This is substantially different from the present invention, in which the grooves are separated from each other such that vortices in turbulent airflow are moved some distance

from its surface. Those skilled in the art would not modify the spacing of the grooves in Shiraishi so that vortices in a turbulent airflow do not interact with the surface since such modifications would appear to reduce the ability to transfer heat from the air-cooled radiators to the moving air.

Further, the Examiner's speculation that there would be negative pressure pockets in the Shiraishi air-cooled radiator design is not mentioned in Shiraishi. While lower pressure pockets may arise when laminar flows exist over the air-cooled radiator, there is no information in Shiraishi that indicates how its air-cooled radiator interacts with turbulent air flow. Further, a low pressure pocket would appear to draw air towards the surface instead of keeping vortices distant from the surface.

In light of the fact that Shiraishi does not specifically show that its air-cooled radiators keep vortices in a turbulent airflow distant from a surface, and because those skilled in the art would not modify Shiraishi to reduce the interaction of air with the air-cooled radiators because that would negatively impact the ability of the radiators to cool the IC chip, the invention of claim 1 is not shown or suggested in Shiraishi. As such, claim 1 and claims 2, 3, and 8, which depend therefrom are patentable over Shiraishi.

With the present amendment, claim 3 has been amended to indicate that the grooves are separated by a distance that is less than 30 milinches. Shiraishi did not show or suggest this dimension for air-cooled radiators. In addition, such a dimension would not be obvious from Shiraishi since the spacing of claim 3 reduces the amount of interaction between the turbulent airflows and the surface. This reduction in interaction would not be desirable in Shiraishi since the air-cooled radiators depend in part on interactions with the air to transport heat from the slider. As such, claim 3 is additionally patentable over Shiraishi.

Independent claim 11 provides a surface for a structure that supports a slider. The surface includes two grooves that are separated from each other in a direction that is substantially parallel to the expected mean airflow such that the grooves cooperate to keep vortices in the airflow some distance from the surface. As discussed above Shiraishi does not show or suggest such grooves. As such, claim 11 and claims 12-18 which dependent therefrom are patentable over Shiraishi.

Independent claim 19 is directed to a data storage device for storing and accessing data. The data storage device includes excitation reduction means defining a surface on a slider support structure for reducing the excitation of the surface by causing eddies in the airflow to be moved away from the surface.

Shiraishi does not show or suggest a structure that performs the same function or achieves the same result as the excitation reduction means of claim 19. In particular, there is no discussion in Shiraishi that the air-cooled radiators of Shiraishi reduce the excitation of a surface by causing eddies in the airflow to be moved away from the surface. In fact, under Shiraishi, the air-cooled radiators would be designed to interact with eddies in the airflow so as to move heat away from air-cooled radiators as quickly as possible.

The Examiner's speculation that the V-shaped grooves in Shiraishi would generate negative pressure pockets that interact with turbulent airflow, is not discussed in Shiraishi and even if true, would not appear to reduce the interaction between the turbulent airflow and the surface. In fact, negative pressure pockets would appear to draw eddies toward the surface.

In light of the arguments above, claims 1-3, 8, 11, 12, 15, 16, 19-21 and 23 are patentable over Shiraishi. Reconsideration and allowance of the claims is respectfully requested.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

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